

REMARKS

This Office Action shows that the Examiner and the applicant both view the present invention and the Hwang et al. and Entrekin et al. references the same way, and also the ways in which the present invention is distinguished from the prior art. However, the Examiner finds that further claim definition is needed to delineate these differences and has helpfully provided guidance to the needed claim definition on page 4 of the Office Action. The Examiner is looking for further definition in the claims of the "component areas" over the single-pixel processing of Hwang et al. and for further definition of how the frames are averaged as contrasted with the moving scanhead detection technique of Entrekin et al.

It is respectfully submitted that this amendment could not have been presented earlier as the Examiner's guidance was contained in the instance Office Action, thereby making this amendment admissible under 37 CFR 1.116.

The Examiner will understand that the present claims were not written to specifically distinguish over Hwang et al. and Entrekin et al., and that applicant is constrained to amendatory language supported by the present application, which is the case of the above amendments to Claims 1 and 13. Responding to the Examiner's first point, these claims have been amended to refer to "multiple pixel" areas or portions of the frames for the assessment of frame-to-frame misregistration due to "motion of the imaged structure." This clearly distinguishes over the single-pixel recursive processor of Hwang et al., which is only responsive to pixel intensity. The typical sizes of such multiple pixel area are given in US Pat. 5,782,766 which is incorporated by reference on page 6, line 13 of the specification. Columns 5-6 of that patent give exemplary search area sizes of 32x32 pixels, 48x48 pixels, and 64x64 pixels. The smallest of these areas, 32x32 pixels, comprises a total of 1024 pixels. Fig. 4B of the

present applications shows an image display divided by dots into a search area grid of 12 areas across and 9 areas high, a total of 108 areas. For even the coarsest video display, a 640x480 pixel VGA display, each of these 108 areas would comprise 2844 pixels. Today's better displays have even better pixel resolution. It is therefore seen that the limitation of the component areas to multiple pixel areas is fully supported by the present application. This responds to the Examiner's request for further definition over the single pixel processing of Hwang et al.

For further definition over Entrekin et al. as to how the frames are averaged, the claims now recite that the persistence is keyed off of the motion of imaged structure in the multiple pixel areas, not scanhead motion as is done in Entrekin et al. The amended claims recite that an area with significant imaged structure motion is displayed with a lower persistence, and an area with less motion is displayed with a higher persistence. This approach is described on page 7, lines 10-16 of the specification, and an example of it is given in Fig. 4B, described on page 9, where the fairly stationary septal wall 254-258 is displayed with high persistence and the rapidly moving mitral valve 220 with lower persistence. This technique adaptively provides the appropriate persistence for the motion of the tissue structure being imaged. In Entrekin et al., as the Examiner recognizes, the spatially compounded frames are few in the survey mode when the scanhead is moving and more in the study mode when the scanhead is stationary. The adaptive technique of the present invention will be effective whether the probe is moving or not. No thought is given in Entrekin et al. to adapting persistence to the motion of the structure being imaged, nor to displaying stationary tissue with high persistence while rapidly moving structures use low or no persistence. Accordingly it is respectfully submitted that the amended claims are patentable over Entrekin et al.

In view of the foregoing amendments and remarks, it is respectfully submitted that the claims have been amended in the two respects called for by the Examiner and that amended Claims 1-22 are not anticipated by Hwang et al. or Entekin et al. Accordingly it is respectfully requested that the rejection of Claims 1-22 under 35 U.S.C. §102(b) be withdrawn.

In light of the foregoing amendment and remarks, it is respectfully submitted that this application is now in condition for allowance. Favorable reconsideration is respectfully requested.

Respectfully submitted,

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